EThер NDE Application Note: AP002

EDDY CURRENT ROTARY DRIVE HOLE INSPECTION

"The AeroCheck Flaw Detector offers the very best in Eddy Current performance with rotary inspection capabilities as standard"
The AeroCheck series can be used with the Ether Mercury (mini) ARD, Hocking 33A100 or the Rohmann MR3/SR1 and SR2 Drives (with special adapter cable) for hole, countersink and surface inspection.

Eddy current rotary inspections of fastener holes and countersinks are performed routinely in the Aircraft Maintenance Industry and now the method is also being used increasingly in the power generation industry for the inspection of bolt-holes on wind turbines. High-speed surface inspection is also another area of increasing usage.

The Mercury Rotary Drive is perfect for tight spaces and is designed and manufactured in-house. It uses our standard rotating probe range. The Mercury Rotary Drive is compatible with: AeroCheck series, Vantage G2, ETi-200, Hocking Phasec 2 & 3 and Industry Standard 4 Pin Fischer Rotary Probes.

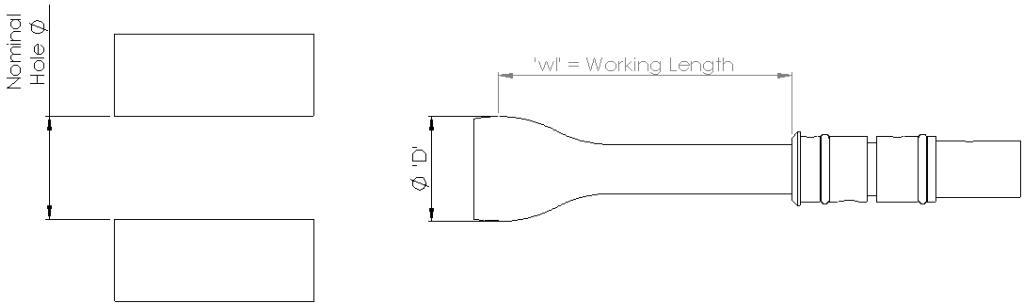
ETher NDE offers the following package to perform Inspections with rotating probes.

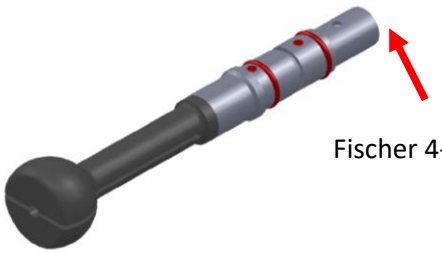
Kit, Rotary Drive (Note requires probes and calibration standard)	KAROT001	
Accessory, Rotating Drive, Small, Lemo 12-Way (MERCURY)	ARD002	1
Accessory, Lead, Lemo 12-Way - Lemo 12-Way, 2.0m (Rotating Drive)	ALL12-L12-020M	1
Accessory, Deluxe Case PHDC1	AC002	1

PROBE SELECTION

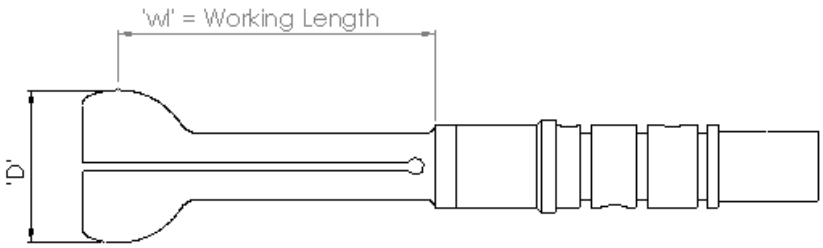
1. Rotating Probes - Reflection

Rigid Stainless Steel





Delrin Flexible



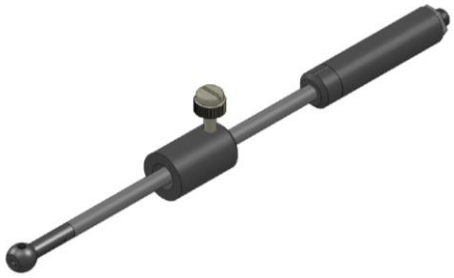
Application: Differential Rotating Probes - for internal diameter inspection of bore holes, countersinks and counter bores.

Specification:

- Probe diameters from 1.6 to 50mm, available in 0.01mm steps
- Fischer connector to EThер Small and Large drive also compatible with Hocking, GE, Rohmann and Forster drive units.
- Frequency range from 200kHz to 2MHz
- Comes in rigid stainless steel and delrin flexible options

Notes:
When ordering rotating probes 0.1mm is automatically taken off probe diameter during manufacture, this should be good for typical hole condition and manufacturing tolerances. Where tolerances are poor allow for greater clearance.
Example: To inspect a ∅12.7 (1/2") hole a ∅12.7 probe should be ordered which will be manufactured to a ∅12.6.

2. Manual Bolt Hole Probes – Absolute



Manual Bolt Hole – Dia 3.2 to 11mm

Manual Bolt Hole – Dia 11.5 to 38mm

Application: For manual internal diameter inspection of bore holes.

Specification:

- All probes have a Delrin Tip
- Connector – Micro for absolute
- Centre frequency/Operating range – 200kHz (50kHz – 600kHz), 500kHz (150kHz – 1.5MHz), 2MHz – (650kHz – 6MHz)

ID PROBE CODING SYSTEM

- **Rigid Stainless Steel Probe Coding**

PRR0159-035

P Probe
R Rotating
R Rigid
0159 Nominal Hole Diameter (mm), Dia= 1.59mm (1/16")
035 Working Length (mm), wl= 35.0mm

- **Delrin Flexible Probe Coding**

PRF040-050051

P Probe
R Rotating
F Flexible
040-050 Hole Diameter Range, Dia= 4.0-5.0mm
051 Working Length (mm), wl= 51.00mm

- **Manual Bolt Hole Probe Coding**

PB200R070-080

PB Probe, Manual Bolt Hole
200 Centre frequency
R Rigid shank
070-080 Tip diameter (mm), Dia= 7.0-8.0, Working Length (mm), wl=76mm#

- **Countersink Probe Coding**

PRC0476

P Probe
R Rotating
C Countersink
0476 Diameter

- **Counter Bore Rotating Probe Coding**

PRR0476-065CB

P Probe
R Rotating
R Rigid
0476 Nominal Diameter, Dia (mm)
065 Working Length (mm)
CB Counter Bore

EXAMPLE PROBES

1. Rotating probes (Rigid Stainless Steel) for internal diameter inspection of fastener holes, countersinks and counter bores.

- **PRRXXXX-XXX**

- **PRRXXXX-XXX**

- **PRRXXXX-XXX**

2. Rotating probes (Delrin Flexible) for internal diameter inspection of fastener holes, countersinks and counter bores

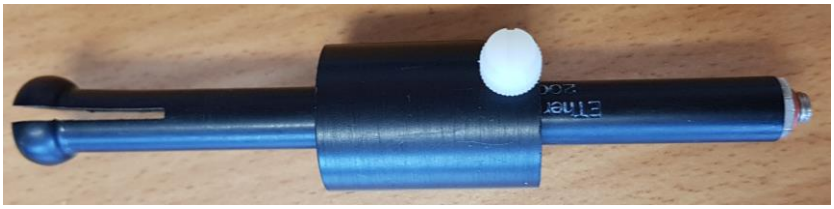
- **PRFXXX-XXXXXX**

3. Counter Bore Rotating Probe for flat bottom hole inspection

- **PRRXXXX-XXXCB**

4. Manual Bolt Holt Probes – Absolute for manual internal diameter inspection of bore holes

- **PBXXXRXXX-XXX**



5. Countersink probes

- **PRCXXXX**

6. Other special probes available

NOTE: See our catalogue for more variants available.

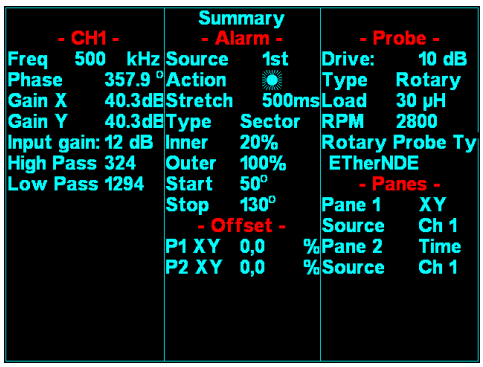
TEST PROCEDURE

Equipment Required:

Accessory: Lead, Lemo 12-Way to Lemo 12-Way – ALL12-L12-020M
Drive: Rotating Drive – ARD002
Probe: Rotating Probe – PRR0953-036 (Probe, Rotating, Rigid, Nominal Hole Dia=9.53mm, Working Length= 36.0mm)
Aluminium Hole Test Block - ATB005

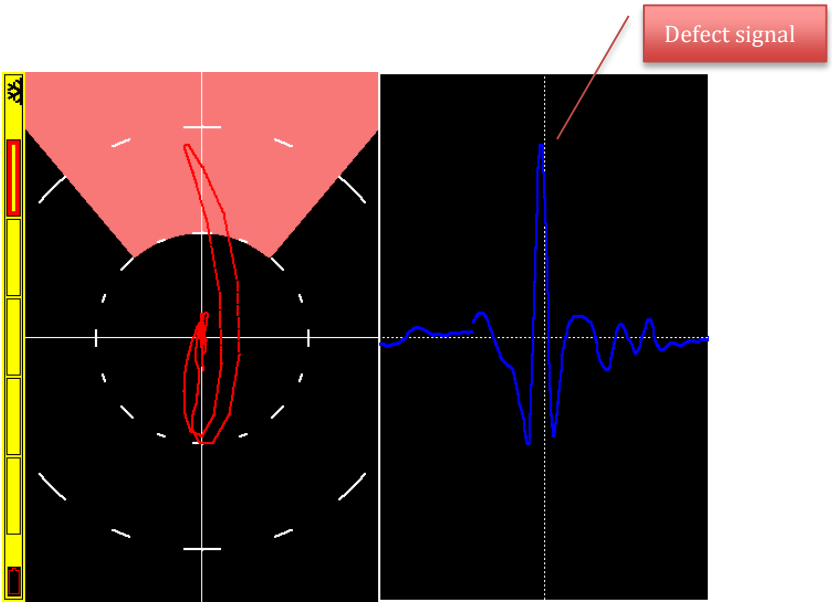
Setup:

1. Connect probe to cable and connect to the instrument.
2. Switch instrument on.
3. Use the cursors to scroll the menu until Load & Save is highlighted, press Enter key. Use the up down cursor to select ROTARY, select the load icon and press Enter.
4. The main Operating screen will appear as soon as the setup has been recalled.
5. Press Balance.
6. Start the drive rotating by pressing the key on the drive.
7. Pass the probe through the hole with the defect.
8. If more or less sensitivity is required, use the Gain (dB key) or Quick-Menu to increase or decrease signal amplitude as required.
9. Move the rotating drive until the signal on the right hand side is positive.



10. Adjust the phase to set the defect signal vertical, on the left hand side, by either using the Probe Phase Item or the Quick-Menu.
11. Activate the Loop function on the lower soft key, once activated adjust the High and Low Pass filters to get the appropriate signal as below.
12. Carry out scan of component.

Results:



NOTE: The procedure will be the same for all rotating probes